

IN THE SPECIFICATION

Please replace the paragraph beginning at page 4, line 25 with the following:

More concretely, a piezoelectric vibrator of the present invention for achieving the objects comprises a piezoelectric sheet; internal electrodes formed on the upper and lower portions of the piezoelectric sheet; cover layers, wherein ~~at least one of the~~ cover layers is formed on each of the upper and lower portions of the piezoelectric sheet on which the internal electrodes are formed; and external electrodes, each of which is connected to each of the internal electrodes; wherein the cover ~~layer is~~ layers formed on the piezoelectric sheet are provided with a vibration grooves, the piezoelectric sheet is fabricated by forming a sheet of slurry, and the vibrator is fabricated by simultaneously sintering the piezoelectric sheet and the cover layers. In such a case, the vibration grooves may be provided between the piezoelectric sheet and cover layers.

Please replace the paragraph beginning at page 6, line 29 with the following:

Each of the external electrodes may be formed on each of the upper, lower and side portions of the laminated element. The vibrator may further comprise insulators on the upper and lower portions of the laminated element, wherein a vibration groove is formed on the insulator. The vibrator may further comprise conductive passages, which pass through the laminated element and are not connected to the internal electrode, and each of which is connected to each of the external electrodes. The vibrator may further comprise three-terminal electrodes provided on a surface of the insulator on which the vibration groove is formed, wherein the insulators comprising dielectrics function as capacitors. The vibrator may comprise at least one dielectric bonded to the laminated piezoelectric element. In such a case, the dielectric is a laminated or single plate type. A dielectric substrate, which functions as a capacitor with terminals, may be installed on the lower portion of the laminated element, and a protective cap for protecting elements is installed on the upper portion of the laminated element. Also, an insulating substrate where ~~the~~ external terminals are formed is installed on the lower portion of the laminate element, and a protective cap for protecting elements may be installed on the upper portion of the laminated

element. The laminated element and the insulators may be green with epoxy for protecting elements.

Please replace the paragraph beginning at page 9, line 23 with the following:

Plural through-holes 306 are formed in the sheets 302, 304 among the sheets fabricated as above with a punching machine. The plural through-holes 306 may be in various shapes, such as rectangle, circle and oval. The plural through-holes 306 are positioned so that they are aligned with internal electrodes of the vibrator. The first upper and lower cover layers 302, 304 are fabricated by filling the through-holes 306 with paste 307, such as carbon paste or PVB- or PVA-based organic paste which can be baked out, using screen printing. The through holes are filled in order to preventing the through-holes from being collapsed when the green sheets are pressed after they are laminated and before they are cut. The first lower cover layer is completed by forming lower internal electrodes 308 for the vibrator on the sheet 302 of the sheets, of which the through-hole is filled with the paste, at predetermined positions with which the through-holes in the sheet 302 are aligned, wherein the lower internal electrodes 308 may be metal electrodes Ag, Pt, or the like formed by ~~sputtering, or may be printed with conductive paste by screen printing.~~ using thick film deposition, such as screen printing, or thin film deposition, such as sputtering, evaporation, chemical vapor deposition, or sol-gel coating. A vibration active sheet is fabricated by forming upper internal electrodes 309 for the vibrator on the piezoelectric sheet 303, in which the through-holes are not formed, and of which the thickness is controlled up to tens micrometers, at predetermined positions of the piezoelectric sheet 303 corresponding to the lower internal electrodes, wherein the upper internal electrodes 309 may be metal electrodes of Ag, Pt, or the like formed by sputtering, or may be printed with conductive paste by screen printing.

Please replace the paragraph beginning at page 11, line 26 with the following:

On a sheet 401 of the sheets as fabricated above, organic patterns 404 for vibration grooves are formed by applying organic paste, such as carbon paste or PVB- or PVA-based organic paste which can be baked out, by screen printing. The organic patterns may be in various shapes such as rectangle, circle and oval. The organic patterns are formed with a predetermined thickness so that the vibration grooves

having a predetermined depth are formed after baking out, and positioned so that the vibration grooves are aligned with internal electrodes of the vibrator. The lower cover layer 401 is fabricated by forming lower internal electrodes 405 for the vibrator on the sheet on which the organic patterns, wherein the lower internal electrodes may metal electrodes of Ag, Pt, or the like formed by sputtering or may be printed with conductive paste by screen printing. A vibration active sheet 402 is fabricated by forming upper internal electrodes 406 for the vibrator on a piezoelectric sheet, of which the thickness is controlled up to ten micrometers as above, wherein the ~~lower internal electrodes 407~~ upper internal electrodes 406 may be metal electrodes of Ag, Pt, or the like formed by sputtering or may be printed with conductive paste by screen printing.

Please replace the paragraph beginning at page 15, line 19 with the following:

The resonator with built-in capacitor of Embodiment 5 comprises a piezoelectric resonator portion R and a capacitor portion C. The piezoelectric resonator portion R comprises piezoelectric sheet 701 having piezoelectricity, internal electrodes 702 formed on the upper and lower surfaces of the piezoelectric sheet, cover layers 703, which are formed on the upper and lower surfaces of the piezoelectric sheet, ~~cover layers 703, which are formed on the upper and lower surfaces of the piezoelectric sheet,~~ and in which vibration grooves are formed, and external electrodes 705, which are formed on both the opposite ends of the piezoelectric sheet and cover layers, and each of which is connected to each of the internal electrodes. The capacitor portion C comprises a dielectric body, which the cover layers 703 fabricated of dielectrics function as, first and second surface external electrodes, respectively, and a third surface external electrode 708, which is formed in the middle of the surface of the dielectric body and insulated from the external electrodes 705.

Please replace the paragraph beginning at page 18, line 10 with the following:

As the piezoelectric resonator portion, ~~resonator~~ piezoelectric sheets 913, 914, 915 are fabricated by forming the piezoelectric sheets using the same method as Embodiments 1 to 4 and forming the electrodes thereon. The upper cover layer 915 is made of piezoelectrics or dielectrics.

Please replace the paragraph beginning at page 18, line 20 with the following:

The first ~~capacitor~~ dielectric sheet 911 is fabricated by forming the first capacitor internal electrodes 906 on one of the dielectric sheets fabricated as above, wherein in the unit chip separated by a dotted line, the first capacitor internal electrodes, each of which is connected to each of the side external electrodes 908 at each side end of the unit chip, are separated from each other. Also, the second capacitor sheet 912 is fabricated by forming the second ~~capacitor~~ dielectric internal electrode 907 on another dielectric sheet, wherein the second capacitor internal electrode 907 is connected to the intermediate external electrode 909 on the front side of the unit chip and is spaced from both the side ends of the unit chip. The structure of the side unit chip is spaced from both the side ends of the unit chip. The structure of the capacitor internal electrodes and the external electrodes of each unit chip is well known in Fig. 9e.

Please replace the paragraph beginning at page 18, line 30 with the following:

The ~~capacitor~~ dielectric sheets 910 to 912 and the piezoelectric sheets 913 to 915 are laminated. The ~~capacitor~~ dielectric sheets may be laminated on the upper or lower portion or both the upper and lower portions of the piezoelectric resonator. The number of the ~~capacitor~~ dielectric sheets to be laminated maybe controlled in order to achieve desired capacitance.

Please replace the paragraph beginning at page 19, line 3 with the following:

A unit chip element body is fabricated by cutting and simultaneously sintering the laminate of the ~~capacitor~~ dielectric sheets and the piezoelectric resonator portion by using the same method as embodiments 1 to 4.

Please replace the paragraph beginning at page 19, line 6 with the following:

The side external electrodes 908, each of which is connected to each of the internal electrodes 902 of the piezoelectric resonator portion and each of the first capacitor internal electrodes 906, are formed on both the ends of the unit chip element body. The intermediate external electrode 909 connected to the second capacitor internal electrode 907, is formed on the front side of the outside of the unit chip element. Then, the piezoelectric vibrator is completed by performing polling process,

which causes the electric dipole to be oriented to one direction by applying the electric field in order to give the piezoelectricity

Please replace the paragraph beginning at page 21, line 3 with the following:

As the piezoelectric resonator portion, ~~resonator~~ dielectric sheets 1014, 1015 are fabricated by forming the piezoelectric sheets using the same method as Embodiments 1 to 4 and forming the electrodes thereon. The upper and lower cover layers 1016, 1013 are made of dielectrics and function as a portion of a capacitor and as cover layers.

Please replace the paragraph beginning at page 21, line 13 with the following:

A first ~~capacitor~~ dielectric sheet 1012 is fabricated by forming the first capacitor internal electrodes 1005 on one of the dielectric sheets fabricated as above, wherein in the unit chip separated by a dotted line, the first capacitor internal electrode is connected to the external electrodes 1008 at a side end of the unit chip. The second ~~capacitor~~ dielectric sheets 1013, 1016 are fabricated by forming the second capacitor internal electrodes 1007 on other dielectric sheets, wherein in the unit chip, the second capacitor internal electrode 1007 is connected to the intermediate external electrode 1010 on the front side of the unit chip. Also, a third ~~capacitor~~ dielectric sheet 1017 is fabricated by forming the third capacitor internal electrodes 1006 on another dielectric sheet, wherein in the unit chip, the third capacitor internal electrode 1006 is connected to the external electrodes 1008 at the other side end of the unit chip.

Please replace the paragraph beginning at page 21, line 24 with the following:

The ~~capacitor~~ dielectric sheets and piezoelectric ~~resonator portion~~ sheets are laminated in the order of the dielectric sheet 1011 constituting the lower capacitor, the first ~~capacitor~~ dielectric sheet 1012, the second ~~capacitor~~ dielectric sheet 1013, the piezoelectric ~~resonator~~ dielectric sheets 1014, 1015, the second ~~capacitor~~ dielectric sheet 1016, the third ~~capacitor~~ dielectric sheet 1017, and the dielectric sheet 1018 constituting the upper capacitor. In such a case, the laminated number of the ~~capacitor~~ dielectric sheets may be controlled in order to control the capacitance.

Please replace the paragraph beginning at page 22, line 1 with the following:

The unit chip element body is fabricated by cutting and simultaneously sintering the laminate of the ~~capacitor~~ dielectric sheets and the piezoelectric resonator portion with the same method as Embodiments 1 to 4.

Please replace the paragraph beginning at page 32, line 1 with the following:

After the desired number of the first dielectric sheets 1616 and the second dielectric sheets 1617 are laminated, the desired number of the ~~resonator~~ piezoelectric sheets 1615 on which the resonator internal electrodes are printed are alternatively laminated so that the spaced distance between the internal electrode and the first side electrode 165 is alternatively different from that between the internal electrode and the second side electrode 1606. Thereafter, the laminated element for a unit element is fabricated by cutting it in unit elements (as indicated by dotted lines). After the laminated element is baked out by heating it in order to remove every kind of the binder components in the laminated element, the laminated element is sintered at the proper sintering temperature by increasing the temperature.

Please replace the paragraph beginning at page 32, line 16 with the following:

The upper electrode 1603 and the lower electrodes 1610, which are not connected to the internal electrodes of the laminate, are formed outside the laminated element, i.e., the resonator with built-in capacitor fabricated according to the respective methods described as above. The upper electrode 1603 is formed to be connected to one of both the sides of the laminate, and the lower electrode 1610 are formed to be connected to both the sides of the laminate and to be insulated in the middle thereof. The first side electrode 1605, which is connected to the upper electrode 1603 of the resonator portion and one of the lower electrodes of the capacitor portion, is formed at a side of the laminates element where the upper and lower electrodes are formed. The second side electrode 1606, which is connected to the lower electrode 1604 of the resonator portion (that is, the upper electrode of the capacitor portion) and the other one of the lower electrodes of the capacitor portion, is formed at the other side of the laminated element. The capacitor side external electrode 1609 (that is, the third side external electrode) connected to the internal electrode of the capacitor portion is formed on the front side of the laminated element. The polling process is performed by applying the electric power to both the external electrodes of the integrated and laminated element where the electrodes are formed,

so that the piezoelectric dipole is oriented. In the case that the integrated and laminated element is fabricated by bonding the respective elements, which are separately fabricated, the resonator portion and the capacitor portion may be bonded after the resonator portion is polled.

Please replace the paragraph beginning at page 33, line 29 with the following:

The resonator with built-in capacitor according to the present embodiment shown in Fig. 17 comprises a piezoelectric resonator portion and a ~~dielectric~~ capacitor portion. The piezoelectric resonator portion comprises piezoelectric body 1701 having the piezoelectricity, internal electrodes 1702 formed in the piezoelectric body, an upper electrode 1703 and a lower electrode 1704, which are formed on the upper and lower portions of the piezoelectric body, respectively, and to which the electric power is supplied, and side electrodes 1705, 1706, which are connected to the upper electrode 1703 and the lower electrode 1704, respectively. The internal electrodes 1702 are not connected to the upper electrode 1703, the lower electrode 1704, and the side electrodes 1705, 1706. The side electrodes 1705, 1706 are formed on both the opposite sides of the piezoelectric body, respectively.

Please replace the paragraph beginning at page 34, line 9 with the following:

The ~~dielectric~~ capacitor portion comprises a dielectric body 1708, and capacitor terminal electrodes 1709 (that is, external terminals) in through-holes of the dielectric body. The terminal electrodes (that is, external terminal) are connected to the upper, lower and side electrodes of the piezoelectric resonator body with conductive adhesive 1707.

Please replace the paragraph beginning at page 39, line 1 with the following:

The resonator with built-in capacitor fabricated according to the present invention can obtain the stable oscillating characteristics and the easily controlled frequency by fabricating the single chip, wherein the capacitors are bonded to the resonator. The resonator with built-in capacitor fabricated according to the present invention can easily be fabricated, obtain the desired oscillating frequency by controlling the thickness of the piezoelectric sheets where the internal electrodes are formed, have the easily controlled capacitance by controlling the number of the laminated ~~capacitor~~ dielectric sheets and the thickness of the ~~capacitor~~ dielectric

sheet, and are fabricated by bonding the capacitors with various configurations to the resonator.